

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 August 2002 (29.08.2002)

PCT

(10) International Publication Number
WO 02/065854 A3

(51) International Patent Classification⁷: **A23L 1/16**,
1/164, A21D 8/04, A23L 1/127, 1/105

(21) International Application Number: PCT/DK02/00114

(22) International Filing Date: 21 February 2002 (21.02.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2001 00285 21 February 2001 (21.02.2001) DK
PA 2001 01447 3 October 2001 (03.10.2001) DK

(71) Applicant (for all designated States except US):
NOVOZYMES A/S [DK/DK]; Krogshøjvej 36, DK-2880
Bagsværd (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ROSS, Andrew
[AU/US]; 5098 SW Technology Loop, Apt. 208, Cor-
vallis, OR 97333 (US). SPENDLER, Tina [DK/DK];
Hjortespringparken 40, DK-2730 Herlev (DK). CHRIS-
TIANSEN, Luise [DK/DK]; Sommerstedgade 11, 2.th.,
DK-1718 København V (DK).

(74) Common Representative: NOVOZYMES A/S; Patents,
Krogshøjvej 36, DK-2880 Bagsværd (DK).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
24 October 2002

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: PRODUCTION OF STARCHY FOOD PRODUCTS

(57) Abstract: Properties of starchy food products such as noodles, fried products and snack prod-ucts may be improved by treating the raw materials with a lipolytic enzyme. The enzyme treatment may improve the dough handling during processing, the texture, the crispiness, the mouthfeel and the appearance. The enzyme treatment may also reduce the oil content of a fried product, increase the firmness, and increase the bulkiness (reduce the bulk density) of a fried product. The lipolytic enzyme may have phospholipase, galactolipase and/or triacyl-glycerol lipase activity.

WO 02/065854 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK 02/00114

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23L1/16 A23L1/164 A21D8/04 A23L1/217 A23L1/105

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23L A21D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EP0-Internal, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU 723 031 B (NISSHIN FLOUR MILLING CO) 17 August 2000 (2000-08-17) page 4, line 11 - line 26 page 6, line 4 - line 18 examples 13-18 ---	4-6
X	US 4 567 046 A (INOUE SEIJIRO ET AL) 28 January 1986 (1986-01-28) cited in the application column 1, line 17 - line 24 examples 8,9 ---	4,5
X	WO 94 04035 A (NOVONORDISK AS ;OLESEN TINE (DK); QI SI JOAN (DK); DONELYN VAHAN) 3 March 1994 (1994-03-03) cited in the application page 11, line 36 -page 12, line 19 claims --- -/--	10,13

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

4 June 2002

Date of mailing of the international search report

09. 09. 2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Vuillamy, V

INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK 02/00114

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 057 415 A (NESTLE SA) 6 December 2000 (2000-12-06) cited in the application the whole document ---	4,5
X,P	WO 01 78524 A (NOVOZYMES AS ;NOVO NORDISK BIOTECH INC (US)) 25 October 2001 (2001-10-25) the whole document ---	1,3,13
A	WO 99 53769 A (NOVONORDISK AS) 28 October 1999 (1999-10-28) cited in the application claim 1 page 5, line 30 - line 35 ---	1-7,9, 10,13
A,P	EP 1 108 360 A (DANISCO) 20 June 2001 (2001-06-20) the whole document ---	1-7,9, 10,13
A,P	WO 02 03805 A (CHRISTENSEN LUISE ;SPENDLER TINA (DK); BUDOLFFSEN GITTE (DK); NOVOZ) 17 January 2002 (2002-01-17) the whole document -----	1-7,9, 10,13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 02/00114

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-7, 9, 10, 13(partly)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7, 9, 10, 13 (partly)

Process for producing starchy FLOUR-BASED food products comprising the steps of:

- preparing a DOUGH comprises flour, water and a lipolytic enzyme;
- holding the dough

2. Claims: 8, 13 (partly)

Process for producing POTATO CHIPS from potato SLICES comprising the step of contacting potato slices with a lipolytic enzyme having a phospholipase or galactolipase activity.

3. Claims: 11, 12, 13(partly)

Process for producing FLAKED or SHREDDED cereals comprising the step of contacting cereal grains or grits with a lipolytic enzyme.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/DK 02/00114

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
AU 723031	B	17-08-2000	JP 3182381 B2 JP 10179065 A AU 723031 B2 AU 4279897 A US 6197360 B1	03-07-2001 07-07-1998 17-08-2000 30-04-1998 06-03-2001
US 4567046	A	28-01-1986	JP 1305944 C JP 59088040 A JP 60030488 B AU 563963 B2 AU 2094083 A CA 1230257 A1 DE 3370746 D1 EP 0109244 A1 KR 9101798 B1 PH 20065 A	13-03-1986 21-05-1984 17-07-1985 30-07-1987 17-05-1984 15-12-1987 14-05-1987 23-05-1984 26-03-1991 18-09-1986
WO 9404035	A	03-03-1994	AT 200006 T DE 69330066 D1 DE 69330066 T2 WO 9404035 A1 DK 659049 T3 EP 0659049 A1 US 6110508 A	15-04-2001 03-05-2001 25-10-2001 03-03-1994 23-07-2001 28-06-1995 29-08-2000
EP 1057415	A	06-12-2000	EP 1057415 A1 BR 0002563 A JP 2001008652 A PL 340487 A1 SK 8252000 A3 US 6326049 B1	06-12-2000 13-03-2001 16-01-2001 18-12-2000 11-12-2000 04-12-2001
WO 0178524	A	25-10-2001	AU 5539201 A WO 0178524 A2 US 2002004085 A1	30-10-2001 25-10-2001 10-01-2002
WO 9953769	A	28-10-1999	AU 3025399 A CA 2326412 A1 WO 9953769 A1 EP 1073339 A1 US 6365204 B1 US 2001055635 A1	08-11-1999 28-10-1999 28-10-1999 07-02-2001 02-04-2002 27-12-2001
EP 1108360	A	20-06-2001	AU 1723801 A BR 0016068 A EP 1108360 A1 EP 1233676 A1 GB 2358784 A WO 0139602 A1	12-06-2001 06-08-2002 20-06-2001 28-08-2002 08-08-2001 07-06-2001
WO 0203805	A	17-01-2002	AU 7235901 A WO 0203805 A1	21-01-2002 17-01-2002